The benefits of managing the intestinal balance

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As an effect of the strict EU feed additive regulation only additives with proven efficacy and stability obtain approval. As to probiotics the EU approval scheme is as constraining as for any other additive and provides reliable indication that the product in question improves pig production.

Probiotics are live micro-organisms that have beneficial effect on the intestinal balance of animals. When used with piglets, sows, grower or finisher the well managed intestinal balance results in improved production and profitability.

However, probiotics have to reach the intestinal tract in a liveable form in order obtain the desired effects. Therefore, stability before and during pelletisation and storage is of key importance when choosing probiotics as a tool for managing the intestinal flora.

It has been proven in more than 40 scientifically designed and controlled trials that BioPlus 2B, manufactured by Chr. Hansen A/S, Denmark, significantly improves pig production when used in feed for sows, piglets, grower and finisher pigs.

When used in piglet feed this product improves feed conversion on average by 5% and weight gain by 10%.

Through stabilising the intestinal flora the use of BioPlus 2B effects reduction in piglet diarrhoea and mortality.

When sows are fed rations with BioPlus 2B, piglet mortality is reduced from the average 10-13% to 7% and weight loss of the sows is reduced as well.

The latest research shows significant increase in litter size at weaning of approximately 8% and a significant decrease in preweaning piglet mortality by 5% when BioPlus 2B is given to lactating sows.

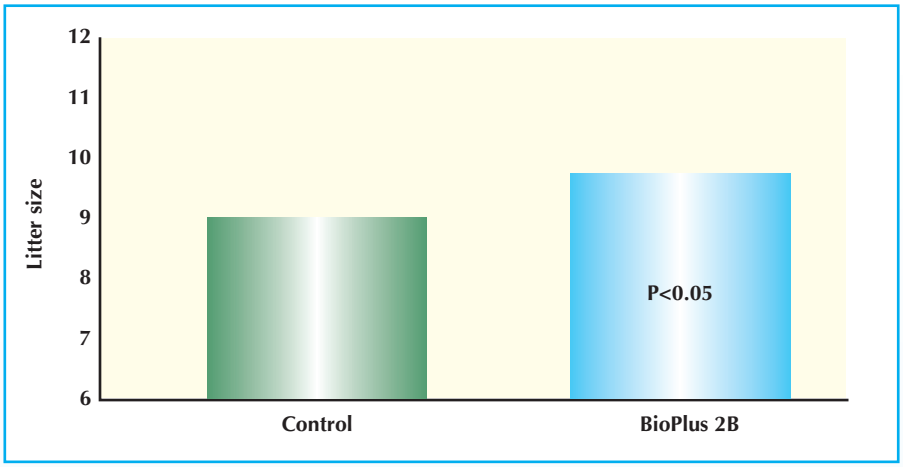

Fig. 1. The effect of probiotic supplementation on litter size.

The science behind the product and the documentation submitted in order to obtain EU approval provided significant (P<0.05) evidence that BioPlus 2B is an effective probiotic that can provide reliable effect and considerable return of investment for pig producers.

Materials and methods

The aim of the field study was to assess the efficacy of an EU approved probiotic, BioPlus 2B, on the health status and performance of sows and their litters.

The study was carried out on a commercial farrow-to-finish pig farm with a breeding stock of 500 sows.

Fourteen days prior to the expected date of farrowing a total of 109 gilts/sows were allocated to the following two experimental groups:

- Control group (55 animals). No treatment.
- BioPlus 2B group (54 animals). Same feed as in the controls plus BioPlus 2B at a dose of 400g per tonne of feed (equal to 1.28 x 10^6 viable spores per g of feed) administered from the day of allocation up to the weaning day.

The following dates were recorded for each gilt/sow – commencement of treatment, farrowing, weaning, post-weaning oestrus and return to oestrus.

Gilt/sow body weights were also recorded at allocation day, at farrowing, 14 days post partum and at weaning. Sow feed and litter creep feed intake were recorded daily.

The health status of gilts/sows and their litters were assessed and recorded regularly. Blood samples were taken from all sows at day 15 of the lactation period and were analysed for the determination of total lipids concentrations.

Additionally, milk samples were collected from all sows at day 14 of the lactation period and were analysed for fat, and protein. For each litter the following numbers were recorded – piglets born alive, dead and mummified, and weaned piglets.

Furthermore, litter body weights at

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Table 1. Effect of BioPlus 2B on economically important characteristics for lactating sows.

	BioPlus 2B	Control
Sow feed consumption (kg)		
Farrowing – two weeks after farrowing	79	76*
Two weeks after farrowing – weaning	105	104
Sow weight loss during lactation (kg)	15	19*
Back fat depth at weaning (mm)	23	23
Total litter growth (kg)	67	59*
Serum total lipid concentration		
two weeks after farrowing (mg/100ml)	294	283*
Content in milk two weeks after farrowing		
fat (%)	6.3	6.1*
protein (%)	4.7	4.5*
Weaning to heat interval (day)	6	6
Return to heat (frequency)	6	20*

**indicates a statistical significant difference (P<0.05)*

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birth and at weaning were recorded. A diarrhoea score on litter basis was calculated after a daily monitoring of each litter.

Data was analysed with a model including parity and feeding group using the GLM procedure of the SAS.

Results and discussion

The trial showed that the probiotic given to lactating sows increased the total weight of piglets produced (kg) during lactation significantly by 13% (Table 1).

An important factor behind the extra productivity is the prolonged period with high fat and protein content in the sow milk demonstrated by the significant 3% and 4% higher milk fat and protein content two weeks after farrowing.

An increase in milk fat concentration should, in theory, be associated with an increased blood serum level of lipids. This is confirmed in the trial. The extra nutrient demand of the lactating sows in the probiotic supplemented group was not followed by an extra loss of body weight.

These sows had a larger feed intake and their total weight loss were significantly reduced by 21% compared with the control group. No difference in back fat depth of sows at weaning was observed.

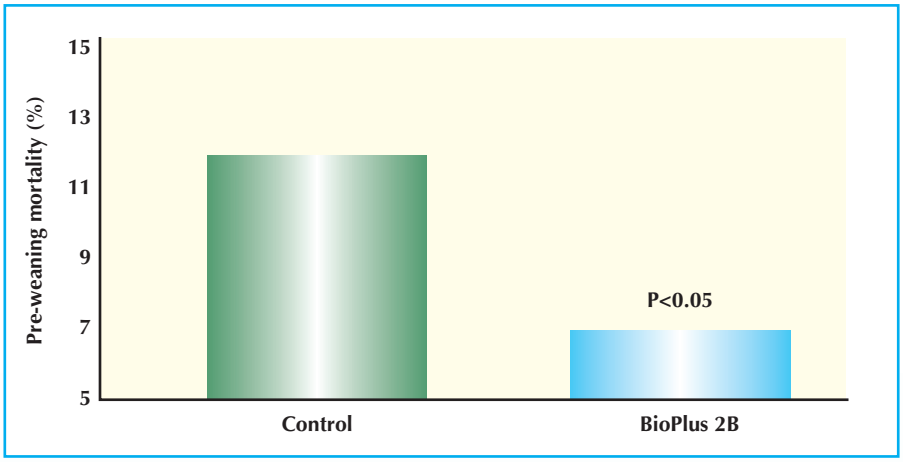

Fig. 2. The effect on pre-weaning mortality.

The probiotic supplemented sows showed a significant reduction in the proportion returning to heat compared with the control group. The improvement of the sow reproduction in the probiotic group was probably due to a better sow condition compared with the sows on the control group caused by the slightly higher feed intake and reduced weight loss.

A significant 8% improvement of litter size at weaning as a result of a significant 42% reduction of pre-weaning mortality of suckling piglets was obtained when lactating sows were supplemented with the probiotic (Figs. 1 and 2).

The reduced pre-weaning mortality was associated with a significantly improved diarrhoea score (Table 2).

Supplementing lactating sows with the probiotic increased piglet and litter weight at weaning significantly by 5% and 13% respectively. In this trial the use of probiotics improved litter weight at weaning by 9.3kg – 3.4kg due to better growth of the suckling piglets plus 6kg due to reduced mortality among suckling piglets.

Suckling piglets from supplemented sows had a significantly better diarrhoea scores and faster growth than those from non-supplemented sows.

These piglets had a larger appetite and showed a larger creep feed intake than suckling piglets from sows receiving non-supplemented feed.

Similar beneficial effects on diarrhoea scores and mortality rate of suckling piglets has been reported then sows were supplemented with probiotics.

Conclusions

The lactating sows supplemented with the probiotic BioPlus 2B improved their nutritional status by increasing their feed intake, but mostly, in this trial, through an increased nutrient utilisation.

The improved nutritional status secured a more uniform sow weight during lactation. The improved sow weight at weaning had a positive impact on reproduction through higher gestation rate.

The suckling piglets from the supplemented sow got an improved nutrient supply through higher fat and protein content in the sow milk and larger creep feed intake. These piglets also showed an improved growth and improved diarrhoea score.

These results support that the physiological basis for the observed improvements in health and growth of suckling piglets is a better functioning gastrointestinal tract. ■

Reference

● Jørgensen J. N. (2004) Field evaluation of the efficacy of a probiotic, 8th Conference on Pig and Poultry Nutrition 2004, Wittenberg: 133-134.

Table 2. Effect of BioPlus 2B on economically important characteristics in piglet production.

	BioPlus 2B	Control
Piglet diarrhoea score[1]	0.08	0.24*
Piglet weight at weaning (kg)	8.40	8.02*
Total creep feed intake per litter	6.4	5.9*

**indicates a statistical significant difference, p<0,05 [1](0=no diarrhoea, 1=slight; 2=middle; 3=acute) pen based score; average of daily score over the suckling period*